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TRUST AND TRUSTWORTHINESS BETWEEN COOPERATORS AND NON-COOPERATIOS IN PUBLIC GOOD PROVISION: EVIDENCE FOR AN ARTEFACTUAL FIELD EXPERIMENT IN ETHIOPIA

By

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Trust and Trustworthiness between cooperators and non-cooperators in Public Good Provision: Evidence from an Artefactual Field Experiment in Ethiopia

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Abstract

The standard economic theory predicts that collective action problem arises because the selfish agents have no incentive to contribute to public goods. However, as revealed by numerous empirical and experimental findings, a substantial share of mankind is willing to contribute to public goods. Ostrom (2000) revised collective action theory predicts that as time passes with proper social norm (institutions) in place, and with information about the types of the agent provided, the share of cooperators in the population will increase, and selfish agents may even disappear from the population. Cooperative agents are trusted more, and hence agents are more likely to be willing to enter in mutually beneficial bilateral exchanges with cooperative agents than with selfish ones. I test this hypothesis in a setting that let participants who are members of collaborative forest management (CFM), and non- members (non-CFM) to play a trust game. Using this experiment, the findings of my study support the hypothesis that higher trust is placed on the cooperators than non-cooperators. Therefore, the cooperator type receives more money, but sends and returns less to non-cooperators which allow the cooperator type to receive consistently higher payoff.

Key words: Collective action, Trust, and Trustworthiness, Field Experiment, Forestry, Public goods.
JEL codes: C12, C93, D64, D71, H41, O13.

1. Introduction

Trust and trustworthiness are important elements in the dynamics of cooperation and development (Fukuyama 1995, Knack 2001, Bouma, Bulte et al. 2008). Trust and other pro-social behaviors are also crucial factors in overcoming collective action problems (Ostrom, 1991; Ostrom, 2014). Standard economic theory predicts that collective action problems arise because selfish agents have no incentive to contribute to public goods (Olson 2009). However, numerous empirical and experimental studies show that substantial shares of mankind contribute to public goods (Fehr and Schmidt 1999, Andreoni and Samuelson 2006, Chaudhuri 2011), implying the existence of the conditional cooperators in addition to selfish agents. Furthermore, cooperators tend to initiate these contribution actions, trust more and are more trustworthy (Ostrom 2000, Knack 2001, Bouma, Bulte et al. 2008, Algan and Cahuc 2010).

However, whether the observed cooperation can be sustained, with multiple types of agents in the population, is an empirical question. Insights can be derived from predictions of existing theories to understand trust and trustworthiness between cooperators and non-cooperators. Social identity theory predicts that people have more affinity towards their fellow in-group member than non-group member (Tajfel 1974). If conditional cooperators and selfish agents can engage in potentially mutually beneficial yet strategically risky exchange opportunities, the prediction of social identity theory could be the strategy taken by the agents. There are extensive experimental studies in discrimination literature which examine in-group and out-group biases (see meta analysis by Lane 2016). Findings of these studies suggest that by and large, out-group biases are the most prevalent phenomena in line with the prediction of social identity theory. However, most of these studies utilized what is called the minimal group paradigm, i.e., laboratory assigned identity which is distinct from real-world identity (Goette, Huffman et al. 2012, Lane 2016). Goette, Huffman et al. (2012), examined to what extent the test of in group-out group biases observed in a minimal group setting yields different result if real identity is to be considered. Their findings pointed out that lab-induced identity and real-world social ties yield different results. And there is a need to conduct more field-based experiments to understand in-group and out-group biases and its role on the outcome such as cooperation.

Another way to understand in-group-out-group biases, in the context of whether to trust or not, is to look at if these biases have also their beginning originated in indirect evolution theory. The indirect evolutionary theory states that biases might arise not only because of the player's identity or social ties but whether the player's given identity is also considered as reciprocal type. This is because the indirect evolutionary theory assumes that perhaps most of the cooperation observed is sustained with the desire of being reciprocated (Güth and Yaari 1992). Accordingly, the less reciprocal types are selected against, which makes reciprocity an evolutionarily stable strategy (Güth 1995).

As an extension of this theory, Ostrom (2014) proposed a revised theory of collective action to explain how trust and other prosocial behavior evolve to enable cooperation. Ostrom's revised theory of collective action predicts that players receive an objective payoff but the decision is based on the transformation of the objective payoff into intrinsic value. For instance, conditional cooperative players value trust, fairness and other pro-social behaviors that in turn, adds a subjective change parameter to actions that are consistent with their norms. Hence, these conditional cooperators are modeled to be a trustworthy type, while selfish agents are forward-looking and self-interested. When information about the types of players (conditional cooperators vs. selfish agents) is provided and if players can engage in potentially mutually beneficial yet strategically risky exchange opportunities, the conditional cooperators will consistently receive a higher payoff. Thus, using evolutionary reasoning only the conditional cooperators will survive if complete information is available (Ostrom 2000).

The similarity of the two theories is that both theories predict the decision of subjects correlates with the identity of whom they are matched with conditional on own identity. Since to trust or not to trust has economic consequences, then the payoffs from the decision depend on i) own identity and ii) identity of another player. This can be demonstrated with a standard trust game (Berg, Dickhaut et al. 1995), where full information of the group and non-group member type is known. The difference between the two theories is described in the following illustration. Suppose in the trust game, there are two types of players; group members and non-group members. Suppose that group members are considered more trustworthy, while non-members are considered to be more selfish. Also assume that there is full information on the types of the players. Then social identity theory predicts that group members trust other group members more than that they trust non-group members, and the reverse will hold for non-group

members. Yet indirect evolutionary theory predicts that both group members and non-group members will put more trust in group members,

To test the pertinence of these theories, I designed a setting in which participants who are members of Collaborative Forest Management group (CFM), along with some non-members (non-CFM), play a trust game. The trust game is a standard experimental procedure to measure the level of trust and trustworthiness (Berg, Dickhaut et al. 1995). The game is played by two players, one of whom is the first mover and the other is the second mover. In the game, the first mover is endowed with a certain amount of money and has to decide if and how much money to send to the second mover. The amount sent by the first mover is usually tripled by the experimenter before it is sent to the second mover. The second mover has to decide how much of the money received to send back to the first mover. Standard economic theory predicts that (selfish) second movers will not return any money, and therefore (selfish) first movers will not send any money in the first place. However, a first mover may give money to the second mover in the hope that her trust will be reciprocated. Trust is then measured by the amount sent, and trustworthiness is measured by the amount returned.

In the current setting, social identity theory predicts that members of a group send higher amounts to other group members than to non-group members whereas non-group members send higher amounts to fellow non-group members. Ostrom's (2000) theory of collective action, on the other hand, assumes that there are (at least) two types of agents, selfish types, and conditional cooperators. And, even though conditional cooperators are more likely to display pro-social behavior than selfish agents at first, in the case of total information provision (about the types of players), all types will favor the cooperator type. As both theories offer different alternative hypotheses we can use the experimental data to test which one is most appropriate.

In this study, the group members are specifically the members of a Collaborative Forest Management (CFM) group. CFM was deployed initially as a rational response to a crisis in forest management in the 21st century that had clearly signaled sustainable forest management to be unfeasible (Lawlor, Madeira et al. 2013, Pinyopusarerk, Tran et al. 2014). CFM is used as a conservation tool in developing countries, the Americas, Australia and also some parts of Europe (Dyke, Cash et al. 2005, Matthews 2009, Kibria, Makoto et al. 2014, Papacostas 2014). In light of the lower productivity of the top-down approach in considering the community's involvement in environmental management, attention was given to designing a management

tool that considers the active involvement of communities in the conservation of natural resources (Frasera, Dougilla et al. 2006, Lawlor, Madeira et al. 2013, Kibria, Makoto et al. 2014).

CFM membership in the study area, the Bale Eco-region of Ethiopia, is in principle voluntary and everyone can become CFM member, but the procedure follows certain rules of eligibility such as geographic proximity to the forest area and length of time having lived in the village (Dubé and Schmithüsen 2014). CFM members are a group of farmers (usually up to 30 individuals in a group) who jointly manage the forest. These CFM groups are assigned a specific forest area to look after by the local government forest conservation office. A village creates as many of these groups as it can form depending on the size and carrying capacity of the forest area in their region. Finally, these groups are administered by one cooperative "body" at the village level. The cooperative is the body responsible for distributing the benefits from the forest to the CFM members.

The extant literature on trust is mostly concentrated around the discussion of cooperation at the individual level, such as if the trusting individuals are also cooperators (Bouma, Bulte et al. 2008, Johnson and Mislin 2011). Meanwhile, the in- and out-group trust – that is, if individuals put equal trust in cooperators and in non-cooperators in a field experiment setting – have received scarce attention in the literature to date (Kugler, Bornstein et al. 2007, Kugler, Kausel et al. 2012, Chaudhuri, Paichayontvijit et al. 2013, Lane 2016). To address this broader aspect, in terms of understanding interactions among the key players (with their identity known), studies have focused predominantly on the role of trust in decision-making as a group and as an individual in laboratory experiments. These groups are typically not natural groups but are constructed by the experimenter (the so-called minimal group design; Bornstein and Yaniv 1998, Wolf, Insko et al. 2008, Luhan, Kocher et al. 2009, Garza, Becker et al. 2011, Goette, Huffman et al. 2012). To our knowledge, there has been no four-dimensional exploration of trust and trustworthiness, in and out of a group, that allows for the systematic interaction of all the players, where the players' identities are provided in the field setting. As will be explained below, I am able to do so because I use an extended version of the strategy method.

Hence, this study differs from previous studies, specifically Kugler, Bornstein et al. (2007), Kugler, Kausel et al. (2012), Chaudhuri, Paichayontvijit et al. (2013), Goette, Huffman et al. (2012) in terms of the design, subject pool and due to the presence of different types in

the sample. The design of this study does not allow for making decisions as a group, but rather as an individual. The experiment uses a combination of a between-subjects design and a within-subjects design in which the participants play a trust game both with a CFM member and a non-CFM member. Hence, the participants play the trust game twice, once with a CFM member and once with a non-CFM member. In addition, they make decisions both as a first mover (sender) and as a second mover (returner). As the identity of the participant (being a CFM member or not) is known, this design enables an investigation of the role of identity, i.e. CFM membership, on the decisions made in the game, in particular on the amounts sent as well as on the amounts returned.

In light of this, the current study aims to examine the role of identity, specifically of being a cooperator, in relation to trust and trustworthiness. The working hypothesis is that given the high level of trust towards the participants in a collective action, the CFM members will receive higher payoffs. The expected channel is that the CFM members will send higher amounts but also that higher amounts will be returned to CFM members.

This study finds the following results. First, both CFM members and non-CFM members send more money to CFM members (typically perceived as more cooperative types) than to non-CFM members, but the difference is not statistically significant. Second, and interestingly, the non-CFM members, in general, send more than the CFM members. However, the difference in the decision made is driven mainly by the behavior of CFM members towards the non-CFM members. Thus, it seems that not only to whom the money is sent matters but also it is important to look at the identity of the sender, i.e. whether or not the sender belongs to the CFM group. Third, regarding returner decisions, we find that the CFM members and non-CFM members behaved differently with respect to the amount returned. The average share returned by CFM members is lower than the share returned by non-CFM members which is caused mainly by the behavior of CFM towards non-CFM members.

These results support the hypothesis that higher trust is placed in individuals who contribute to real-world public good provision – CFM members. The CFM members receive more money than non-members, but they send and return less, specifically to non-members. CFM members thus benefit more from participating in the trust game than non-members. Note that the CFM members in the area are not considered more powerful than non-members since the benefits that a member derives from cooperation are more of intrinsic nature than objective benefits. For example, one can easily access fire wood and timber products from the market

without sacrificing time and effort looking after the forest blocks, and instead, choose to spend more time on other (agricultural) activities. Moreover, as will be discussed in more detail later in the paper, we see that both the CFM and non-CFM members are equally engaged in other social interaction activities. Also note that in order to rule out the possibility of misunderstanding the game by the CFM members as an opportunity they can use to be rewarded for their everyday cooperative behavior, the experimenters have thoroughly explained that the final payoff of participants only depends on the decisions they make during the trust game.

Hence, at first, it seems that there is some kind of paradox that although CFM members may trust non-CFM members less (and thus send less), the non-CFM members are in fact more trustworthy (return more). However, the findings suggest that the possible channel in which the cooperating types consistently derive higher payoffs is probably in line with Ostrom's revised theory of collective action. Nevertheless, we do not have a repeated trust game setting to fully claim these results the stable strategy in the long run. This can be addressed with future research.

The policy relevance of this study relates to understanding pro-social behavior with relation to engagement in collective good management and maximizing the advantages that arise with it (see Bouma, Bulte et al. 2008, Ostrom 2008). Recently, collective environmental management has been proposed as a tool to further address global climate change (Ostrom 2010) through the implementation of REDD+ (Reduction of emission from deforestation and forest degradation) (Newton, Oldekop et al. 2016, Pelletier, Gélinas et al. 2016). Hence, understanding the functioning of trust and other pro-social behavior among the "local conservation groups" and other non-member individuals is crucial (i) to deepen our understanding of the role of pro-social behavior between cooperators and non-cooperators; (ii) to examine the prudence of collective level environmental management. By conducting a field experiment in a relevant study area, we attempt to learn and understand the behavior of people who are individually involved.

2. EXPERIMENTAL DESIGN, PROCEDURE, AND HYPOTHESES

2.1 The Field

The context of the study is the Bale Mountains Eco-region in Ethiopia (see Chapter 2 for more information).

The sample in this study is taken from Dodola "Woreda" (the lower administration level next to regional administration), out of which three villages were selected: Bura-Adelle, Kechema, and Geneta (see Figure 1). These villages were selected because they were among the first to implement forest management in the Bale Eco-region, and they are more accessible in terms of infrastructure. The three villages in this study (Bura-Adelle, Kechema, and Geneta) were selected because they are more accessible in terms of infrastructure, and more important for the current study, they were among the first to implement forest management in the Bale Eco-region.

CFM is a joint action by a group of farmers, in which one group contains up to 30 individuals, to conserve the forest block assigned to them in their respective villages. All the groups in different villages are organized under one cooperative that is responsible for sharing the benefits accrued from forest products and from the hunting permitted in the forest. Members are in return rewarded from these benefits. In this study, although all the participants are forest dependent, not all of them are members of collaborative forest management (see Appendix 3 for details).

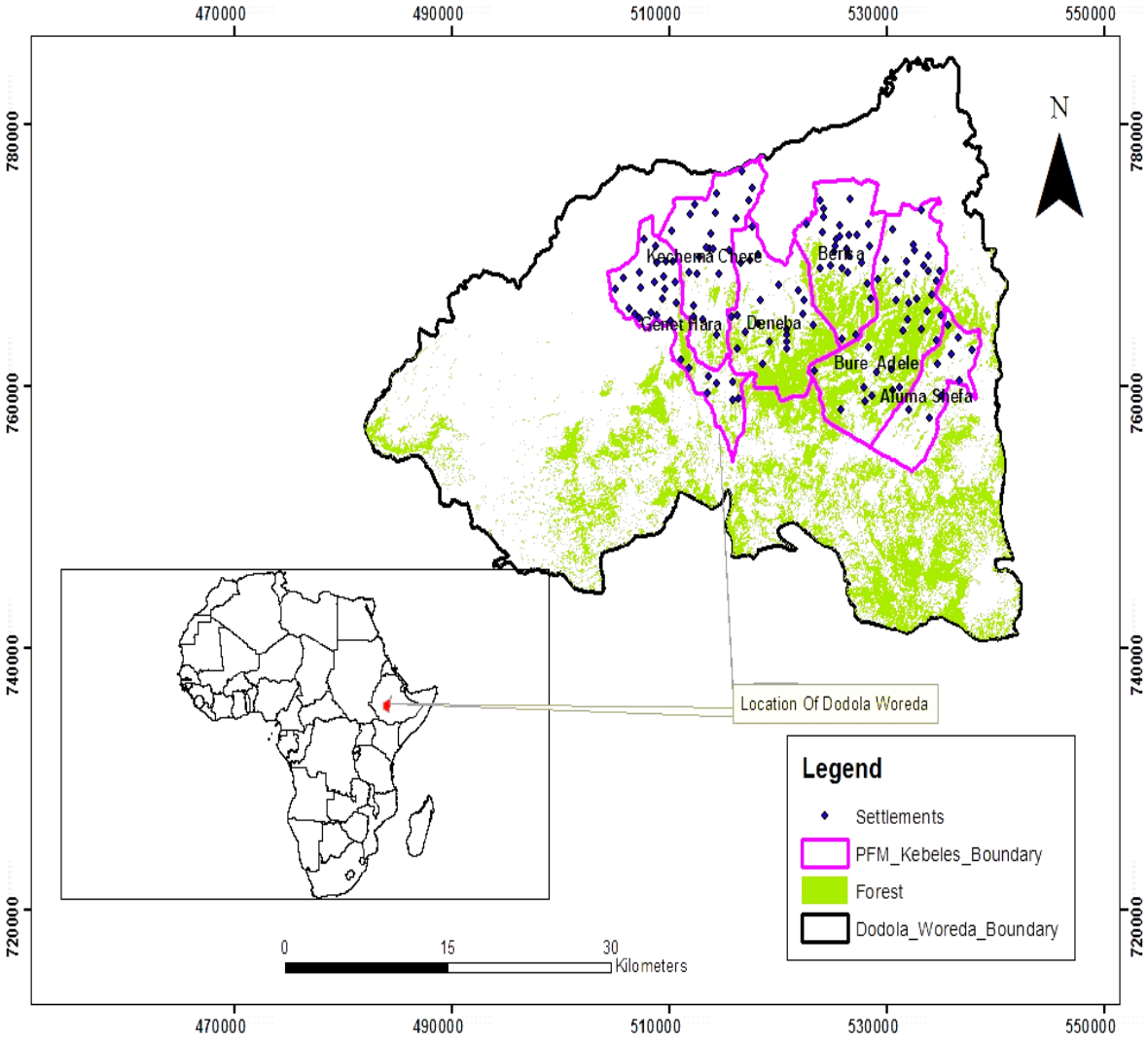


Figure 1: Map of the study area.

2.2 Experimental Design

The experiment employed in this study is based on a trust game. In a standard two-player trust game, developed by Berg et al. (1995), both players are endowed with a certain amount of money. One player (Player 1, the trustor) has to decide how much of his endowment to send to another player (Player 2, the trustee). In its standard format, the amount sent by Player 1 is tripled by the experimenter and given to Player 2. Then, Player 2 has to decide how much of the amount received she wants to send back to Player 1. The payoffs for Player 1 are

the amount kept as Player 1 plus the amount returned by Player 2, whereas the payoffs for Player 2 are equal to the amount she received minus the amount she sent back to Player 1.[1] Using backward induction, standard economic theory predicts that Player 2 will not return any money, and thus Player 1 will also not send any money. Numerous studies have found, however, that both the amounts sent and amounts returned are positive, but also that decisions are affected by experimental parameters ((such as endowment, multiplication factor, etcetera, see Johnson & Mislin, 2011).

In the experiment, I implement two changes compared to this standard trust game. First of all, in a standard trust game, subjects play only one role; that is, they are either the trustor (sender) or the trustee (returner/receiver). In the current experiment, each subject plays both roles. Second, rather than hot decision making, I apply the strategy method (Selten, 1967), in which subjects have to make decisions for every situation that may arise – in this case, whether they are matched with a CFM member, or with a non-CFM member. In each role, players thus have to make two choices. In particular, in their role as Player 1, each subject has to make two decisions: (i) how much he wants to send to the other subject if the other subject is a Collaborative Forest Management (CFM) member, and (ii) how much he wants to send to the other subject if the other subject is not a Collaborative Forest Management member (non-CFM). The same approach is used for return decisions. That is, in their role as Player 2, each subject has to indicate how much he wants to send back to the other subject (i) if the other subject is a CFM member; (ii) if the other subject is a non-CFM member. Note that the use of the strategy method or the fact that subjects play both roles and make multiple decisions does not affect the game-theoretic predictions based on standard, selfish and money-maximizing preferences. Experimental findings and insights from behavioral economics suggest, however, that both variations could have an impact on behavior.[2] This should not matter for our experiment and results, as this study's aim is not in absolute levels but in (treatment) differences in behavior towards CFM members and non-CFM members, and between CFM members and non-CFM members.

[1] There are several variants of the standard trust game. One of the variations is to give Player 2 no endowment or a positive endowment. We have chosen to not endow Player 2.

[2] For example, Burks et al. (2003) find that playing both roles reduces both trust (the amount sent) and reciprocity (the amount returned). Casari and Cason (2009) report that the strategy method gives similar rates of trust but significantly lower rates of trustworthiness. Note, however, that in their study trustors could only send nothing or the full amount. Differences are often attributed to differences in emotions and intentions associated with the environments.

The details of the experimental design are as follows (see Appendix 1 for the instructions). First, all subjects have to make two decisions as Player 1. Player 1 is given ETB50 (which is half a day's wage) at the start of the game (Player 2 receives 0), and each Player 1 has to decide how much of the ETB50 he wants to send to Player 2. There were six possible choices: ETB0, ETB10, ETB20, ETB30, ETB40 and ETB50. As explained above, Player 1 has to make two decisions: how much she wants to send to Player 2 if Player 2 is a CFM member, and how much she wants to send to Player 2 if Player 2 is a non-CFM member. Then all subjects have to make decisions as Player 2. As Player 2, each subject has to decide for each of the possible amounts received, how much she wants to send back to Player 1. For example, if ETB10 is chosen by Player 1, Player 2 receives ETB30, and she can decide whether to send back ETB0, ETB10, ETB20 or ETB30. Also as Player 2, subjects have to make two series of six decisions: (i) how much money they want to send back to Player 1 if Player 1 is a CFM member conditional on that CFM member sending her 0, 10, 20, 30, 40 or 50 ETB, and (ii) how much they want to send back to Player 1 if Player 1 is a non-CFM member, for each of the 6 possible amounts they can receive.

In order to make all choices' potential payoff relevant, the payoffs to each subject were based on random matching and random role assignment, which was done after all decisions had been made. First, after all, decisions had been made, pairs of two subjects were formed, and one subject in each pair was randomly assigned the role of Player 1 (trustor) and the other of Player 2 (the trustee). Then for both subjects, it was checked if they were a CFM member or a non-CFM member, and this determined which of the decisions was implemented. So for example, suppose a CFM member was assigned the role of Player 1, who was matched with a non-CFM member playing the role of Player 2. Payoffs for both participants were then determined by (i) verifying how much the CFM member would be willing to send if she was matched with a non-CFM member (say 20 ETB), and (ii) looking up how much of the 60 ETB the non-CFM member would be willing to return if she was matched with a CFM member who would send him ETB 20. All details of the experiment including the matching and the payment procedure were explained to the subjects.

2.3 Experimental Procedure

The experiment took place from January 8-10, 2016, in one of the lower administrations in the Bale Eco-region of Ethiopia. The participants in the experiment are forest-dependent individuals from three villages (Bura-Adelle, Kechema and Geneta). The invitation to subjects

to participate in the experiment was made with the help of development agents from Oromia Forest and Wildfire Enterprise who work closely with forest-dependent communities in general and with CFM members in particular. The development agents asked the leaders within these villages to send 30 to 35 participants per village to the meeting/experiment; the sample had to include both CFM and non-CFM members.

Upon the participants' arrival to the session, an introductory meeting was held in the open field (where they usually hold meetings), and the local development agent introduced the research team to the participants. Next, the research team informed the participants of the general objective of the research, followed by the experiment's instructions. Further explanation was given when necessary to make sure that the participants understood the procedure. Details of the decision-making were provided when players were interviewed individually, specifically concerning the possible choices they had when making decisions as a first mover and a second mover. Hence, after the joint instruction, the subjects were individually approached for a survey and to make decisions in the experiment.

Subjects came forward to make their decisions one by one, and were invited to wait for the procedure to continue in an area that was physically separated from the area where the yet-to-be-interviewed participants were waiting. Interviewing one participant took 15 minutes on average. There were four data collectors and interviewers including the researcher, without including the development agent who was the facilitator at the experiment site. Per village, the trust game experiment took on average two and half hours including time spent on explaining and illustrating the game as well as answering questions from the subjects.

At the end of the experiment, after all the subjects were interviewed and made their decisions, the random assignment of a role was implemented. It was done so by using separate matching cards on which we filled in information such as card number, participant's membership status in a Collaborative Forest Management (CFM), amount to be sent to CFM and non-CFM member, and finally the amount to be returned for all possible amounts sent (0, 10, 20, 30, 40, 50) to CFM and non-CFM members. After filling out all the information on the matching card, the cards were placed in a box and mixed together to enable the random matching. Matching was done in such a way that by definition the first card picked was assigned the role of Player 1, while the second card picked was assigned the role of Player 2. Then, the information on the cards was used to see whether players were matched with a CFM or non-CFM member and implemented the appropriate decisions of both players to calculate

the payoffs. The matching was done anonymously but in front of the participants. Finally, the participants were called forward to collect their money based on the decision they made. Note that the final payoffs depended on actual CFM membership status of the person a subject was paired with, such that subjects had an incentive to use their true preferences and beliefs (which may be different when they are matched with CFM or non-CFM members). Decision-makers did not get a chance to know the person with whom they were matched, and their identity was kept anonymous.

2.4 Hypotheses

The main question that is addressed in this study is whether trust and trustworthiness depend on the identity of the person (being a CFM member or not) and/or on the identity of the person she is matched with. Based on the discussion in the introduction, several testable null hypotheses can be formulated.

H1: CFM members send the same amount as non-CFM members.

This hypothesis can be divided into two sub-hypotheses in two ways, thus resulting in four testable hypotheses:

H1a: CFM members send the same amount to CFM members and to non-CFM members;

H1b: Non-CFM members send the same amount to CFM members and to non-CFM members.

H1c: CFM members and non-CFM members send the same amount to CFM members;

H1d: CFM members and non-CFM members send the same amount to non-CFM members.

As argued in the introduction, there may be (at least) two reasons why one may expect behavior to be different. The first reason follows from social identity theory (Tajfel, 1974), which suggests that people have more affinity with in-group members than with out-group members, and as a result they will treat in-group members more favorably. In the current setting, this theory predicts that CFM members will send higher amounts if they are matched with CFM members than if they are matched with non-CFM members, whereas non-CFM members will send higher amounts to non-CFM members. Ostrom's theory of collective action, on the other hand, assumes that there are (at least) two types of agents, selfish types and (conditional) cooperators where cooperators are more likely to display pro-social behavior than

selfish agents.[3] Assuming that CFM members are the more cooperative type, this theory would predict that CFM members at first send more to CFM members and to non-CFM members.

Combined with the assumption that CFM members are the more cooperative type, thus more trusted, this theory would predict that CFM members receive higher amounts than non-CFM members, irrespective of the identity of the sender. As both theories offer some different alternative hypotheses, the experimental data can be used to test which one is most appropriate. For example, both theories suggest that hypothesis H1b will be rejected, but Ostrom's theory predicts that non-CFM members send more to CFM members whereas social identity theory does not. Similarly, while Ostrom's theory suggests that H1c will not be rejected (as amount sent to CFM members is the same), social identity theory predicts that it will be rejected (as CFM members send more to CFM members).

In a similar vein, null hypotheses for the amount returned can be derived as the following;

H2: CFM members return the same share as non-CFM members.

Again this hypothesis can be divided into four testable sub-hypotheses:

H2a: CFM members return the same share to CFM members and to non-CFM members;

H2b: non-CFM members return the same share to CFM members and to non-CFM members.

H2c: CFM members and non-CFM members return the same share to CFM members;

H2d: CFM members and non-CFM members return the same share to non-CFM members.

Here again, social identity theory and Ostrom's theory may offer some conflicting hypotheses. For example, the first would predict that non-CFM members would return more to non CFM members than to CFM members, whereas the latter would predict the opposite.

[3] According to Ostrom's theory, cooperators are not only more likely to display pro-social behavior than selfish agents at first but in the longer run also end up receiving higher payoffs because they are more trusted. Since the time frame in the experiment is very short, we do not focus on this.

3. RESULTS

3.1. The Sample

Table 1 presents the descriptive statistics of the participants of each village in the experiment and balance tests of covariates using orthogonality tests. There were 96 participants from the three villages. Note that these are the same individuals as those who participated in the Valuation paper (Kitessa, 2017). The three villages have household compositions that are quite similar in terms of various characteristics, alongside the geographical one. Table 1 shows that in all the villages the participants in the experiments are predominantly male. This is probably because of the cultural setting in which, as the household head, the male is more likely to attend meetings. In a similar way, except for one village (Village 1), more than half of the sample population have a family size of 10 members or more in one household. In all of the villages, only 20% of the households have families with fewer than four members. This shows that the study area is characterized by large families and the average number of children is much higher than the country's average of 4.1 children per household.

In the sample, the reported average income of the households ranges from 2,500 ETB to slightly above 4,500 ETB per month, and the reported land size in hectares is 2.47 on average (within the range of 2.16 to 2.78 hectares).

Table 1: Descriptive Statistics

Variable	Village 1	Village 2	Village 3	(1) vs. (2)	(1) vs. (3)	(2) vs. (3)	p-value of overall test
Male (%)	0.853	0.875	1.000	-0.022	-0.147**	-0.125**	0.102
	(0.062)	(0.059)	(0.000)	(0.086)	(0.066)	(0.061)	
Family size of 4 or less (%)	0.176	0.094	0.033	0.083	0.143*	0.060	0.173
	(0.066)	(0.052)	(0.033)	(0.033)	(0.077)	(0.063)	
Family size within the range of 5 to 7 (%)	0.206	0.188	0.233	0.018	-0.027	-0.046	0.908
	(0.070)	0.070)	(0.079)	(0.099)	(0.105)	(0.105)	
Family size within the range of 8 to 10 (%)	0.206	0.094	0.167	0.112	0.039	-0.073	0.456
	(0.070)	(0.052)	(0.069)	(0.089)	(0.099)	(0.086)	

Family size of 11 or more (%)	0.412 (0.086)	0.625 (0.087)	0.567 (0.092)	-0.213* (0.122)	-0.155 (0.126)	0.058 (0.127)	0.204
Mean income (ETB)	2552.073 (353.689)	3480.500 (543.309)	4884.514 (539.248)	-928.426 (640.770)	2332.440*** (630.928)	-1404.014* (766.487)	0.004
Mean hectares of land owned	2.483 (0.286)	2.164 (0.257)	2.780 (0.263)	0.319 (0.386)	-0.297 (0.392)	-0.616* (0.367)	0.289
Participants below 25 years of age (%)	0.029 (0.029)	0.000 (0.000)	0.033 (0.033)	0.029 (0.030)	-0.004 (0.044)	-0.033 (0.032)	0.605
Participants within age group of 25 to 35 (%)	0.265 (0.077)	0.313 (0.083)	0.200 (0.074)	-0.048 (0.113)	0.065 (0.107)	0.112 (0.112)	0.608
Participants within age group of 36 to 55 (%)	0.441 (0.086)	0.313 (0.083)	0.667 (0.088)	0.129 (0.120)	-0.225* (0.123)	-0.354*** (0.121)	0.018
Participants above 56 years of age (%)	0.265 (0.077)	0.375 (0.087)	0.100 (0.056)	-0.110 (0.116)	0.165* (0.097)	0.275** (0.105)	0.042
Participants with no formal education (%)	0.235 (0.074)	0.219 (0.074)	0.067 (0.046)	0.017 (0.105)	0.169* (0.090)	0.152* (0.089)	0.162
Participants with up to 5 years of schooling (%)	0.559 (0.086)	0.625 (0.087)	0.433 (0.092)	-0.066 (0.123)	0.125 (0.126)	0.192 (0.127)	0.315
Participants with 6-8 years of schooling (%)	0.206 (0.070)	0.156 (0.065)	0.467 (0.093)	0.050 (0.096)	-0.261** (0.115)	-0.310*** (0.112)	0.012
Participants with 9 or more years of schooling (%)	0.000 (0.000)	0.000 (0.000)	0.033 (0.033)	0.000 (0.000)	-0.033 (0.031)	-0.033 (0.032)	0.336
Mean non-members of Dabo (%)	0.088 (0.049)	0.563 (0.089)	0.400 (0.091)	-0.474*** (0.100)	-0.312*** (0.100)	0.162 (0.127)	0.000
Call Dabo two times per year (%)	0.676 (0.081)	0.250 (0.078)	0.500 (0.093)	0.426*** (0.113)	0.176 (0.123)	-0.250** (0.121)	0.002

Call Dabo more than two times per year (%)	0.235 (0.074)	0.188 (0.070)	0.100 (0.056)	0.048 (0.102)	0.135 (0.094)	0.087 (0.090)	0.369
Mean members of Idir (%)	0.147 (0.062)	0.250 (0.078)	0.267 (0.082)	-0.103 (0.099)	-0.120 (0.101)	-0.017 (0.113)	0.456
CFM members (%)	0.765 (0.074)	0.719 (0.081)	0.433 (0.092)	0.046 (0.109)	0.331*** (0.117)	0.285** (0.122)	0.012
No. of participants	34	32	30	66	64	62	

*Standard deviation in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

It is also important to note some between-village differences. In village 3, both income and the hectares of land owned are on average much higher than in the other two villages. It is sensible that average income is higher where the size of land owned is relatively higher, given that almost all the participants are farmers.

Less than 3% of participants in the experiment are within the age bracket of 25 years and below. In fact, the majority are adults of 35 years of age and above. The younger age group (25-35 years) accounts for about 26% of the participants.

With regard to participants' literacy status, about half of the participants have up to 5 years of schooling, while village 3 seems to be relatively more educated than the other two villages. Thus, the sample of this study predominantly consists of farmers with low literacy status who are also forest dependents. Other variables will be discussed in later sections.

In general, although some differences exist between the villages, the sample is rather balanced in terms of observable characteristics. Importantly, even though we control for village differences later in the analysis, we do not believe that the differences between the villages matter, as we are interested in the effect of identity (treatment differences).

3.2. Experimental Results

3.2.1 Descriptive statistics and non-parametric test results

Table 2 presents the summary statistics of the trust game. This table reports the average amount sent by Player 1 in case she is matched with a CFM member and also for the case she is matched with a non-CFM member. Similarly, the average amount returned by Player 2, for all (possible) discrete values that were initially sent by Player1, are shown in the table. These decisions (on

how much to send as Player 1 and to return as Player 2) were made twice, with respect to a CFM member and a non-CFM member. Column 1 presents the average amount sent (returned) to CFM members, while column 2 reports the average amount sent (returned) to non-CFM members. The last column shows the p-values of Wilcoxon matched-pairs signed-ranks test comparing the two values.

The first and second column of Table 2 show that on average, the mean amount sent by Player 1 is 15.70, which is about 31.40% of the initial endowment. This measures the trust level. To get some idea about the trust level in this study, it can be compared with the trust levels observed in various other studies. It turns out that compared to all regions of the world, this average is rather low, even though some variation across studies and regions can be observed (see Table 3). This relatively small amount sent seems to be in line with the previous finding that trust is lower in African countries compared to other regions of the world (see the meta-study by Johnson and Mislin, 2011). The same two columns in Table 2 also show that the average amount sent to CFM members is almost 1.5 as high as the average amount sent to non-CFM members (18.64 versus 12.76). A Wilcoxon matched-pairs signed-ranks test shows that this difference is statistically significant at the 1% level (see the last column).

Table 2: Summary statistics of trust game

	Matched with CFM member	Matched with non-CFM member	p-values (Wilcoxon signed-ranks test)
Mean amount sent by Player 1	18.64 (10.22)	12.76 (8.14)	0.000
Mean amount returned by Player 2			
if trustor sends 10	12.55 (6.53)	11.09 (5.77)	0.043
if trustor sends 20	22.92 (11.96)	20.00 (11.69)	0.008
if trustor sends 30	35.89 (18.97)	31.88 (17.09)	0.034
if trustor sends 40	48.54 (24.41)	41.46 (26.03)	0.004
if trustor sends 50	57.29 (30.80)	51.61 (30.04)	0.023

Share amount returned by Player 2			
if trustor sends 10	0.418 (0.22)	0.369 (0.19)	0.049
if trustor sends 20	0.382 (0.20)	0.333 (0.19)	0.007
if trustor sends 30	0.399 (0.21)	0.354 (0.19)	0.035
if trustor sends 40	0.405 (0.21)	0.345 (0.22)	0.003
if trustor sends 50	0.382 (0.21)	0.344 (0.02)	0.022
Average share returned	0.397	0.349	0.000

Note: Standard deviations in parentheses; last column indicates the p-values of statistical tests of difference in values reported in the second and third columns (Wilcoxon matched-pairs signed-ranks tests).

The amounts and shares returned by Player 2 to CFM and non-CFM members are also reported in Table 2. It should be noted that for all possible values that Player 2 received, they decided to return on average at least 30 percent. Taking averages of shares returned at all levels, the overall average share is about 0.35, which is slightly greater than the shares returned in some parts of the world (see Table 3). Interestingly, comparing the shares returned in columns 1 and 2 of Table 2, we observe that for all possible amounts sent, a higher share is returned to a CFM member (column 1) than a non-CFM member (column 2), and all differences are significant at the 5% level, at least. This shows that the CFM members received consistently and significantly higher returns on their initial investments.

Table 3: Fraction sent and returned in trust games by region

Variable name	Obs.	Sum N	Mean	Std. dev.	Min	Max
Panel A: Fraction sent (trust)						
All regions	161	23,900	0.502	0.124	0.224	0.885
North America	46	4579	0.517	0.158	0.259	0.885
Europe	64	9030	0.537	0.121	0.224	0.783
Asia	23	3043	0.482	0.102	0.285	0.710
South America	13	4733	0.458	0.074	0.336	0.857
Africa	15	2515	0.456	0.133	0.300	0.750
This study	To CFM	96	0.373	0.204	0.000	1.000
	To non-CFM	96	0.254	0.163	0.000	1.000
Panel B: Proportion returned (trustworthiness)						

All regions	137	21,529	0.372	0.114	0.108	0.812
North America	41	4324	0.340	0.089	0.119	0.496
Europe	53	7596	0.382	0.094	0.108	0.542
Asia	15	2361	0.460	0.114	0.215	0.597
South America	13	4733	0.369	0.147	0.184	0.812
Africa	15	2515	0.319	0.106	0.180	0.514
This study	To CFM	96	0.397	0.178	0.000	1.000
	To non-CFM	96	0.349	0.168	0.000	1.000

Source: (Johnson & Mislin, 2011). The number of observations (obs.) is the number of studies reported in the meta-study.

Next, we consider the role of identity by breaking down the cooperators' and non-cooperators' behavior. We do so by examining the amounts sent by subjects who are CFM members and those who are non-CFM members. Table 4 shows that both the CFM and non-CFM members alike send more to CFM members than to non-CFM members. For both groups, these differences are highly significant ($p < 0.01$, Wilcoxon matched-pairs signed-ranks test). Furthermore, non-CFM members send on average about 2.5 ETB more than the CFM members. However, the results from a Mann-Whitney U test indicate that the difference is not statistically significant when the receiver is a CFM member, whereas it is highly significant when the receiver is a non-CFM member ($p = 0.002$, Mann-Whitney U tests).

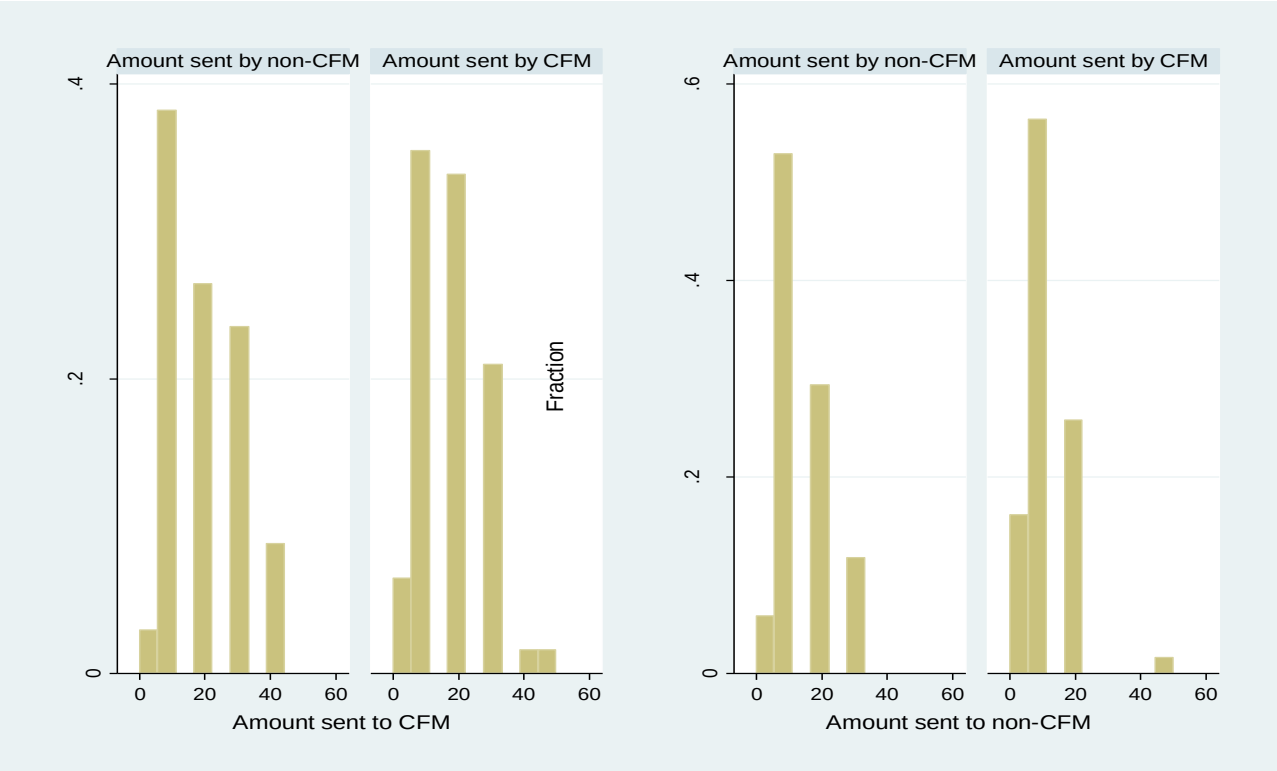
Table 4: Amount sent to CFM and non-CFM by CFM membership status (Identity)

	Amount sent to CFM	Amount sent to non-CFM	p-values (Wilcoxon signed-ranks test)
Mean sent by CFM	18.06 (10.06)	11.61 (8.137)	0.000
Mean sent by non-CFM	19.71 (10.58)	14.71 (7.87)	0.012
p-values (Mann-Whitney U test)	0.51	0.002	
Observations	62	34	

Taken together, these results support our hypothesis that CFM members are viewed as more trustworthy than non-CFM members, not only by fellow CFM members but also by non-CFM members. At the same time, however, non-CFM members send more than CFM members, regardless of the membership status of Player 2, which suggests that they trust more.

A graphical summary of the decision-making allows us to document the divergence in behavior between the two groups in more detail. Figure 2 presents the histograms of the amounts sent in the trust game by the CFM and non-CFM members, in the right panel and left panel, respectively. According to Figure 2, the distributions of the amounts sent to CFM members by both CFM and non-CFM members differ slightly from the distributions of the amounts sent to non-CFM members. For instance, the distribution of amounts sent to non-CFM (by both CFM and non-CFM) is more right skewed and shows a central tendency on a lower value relative to the other group. In contrast, the amounts sent to the CFM members show a rather normal distribution. Interestingly, both CFM and non-CFM behaved in a relatively similar way towards CFM members. Thus, the distributions of amounts sent in this experiment differ in shapes based on with whom the participants were matched (CFM vs. non-CFM). This claim is also supported by the formal test of difference in distributions. The Kolmogorov-Smirnov test shows that there is no difference in distributions between the amounts sent to CFM by CFM and non-CFM- the first panel. And Kolmogorov-Smirnov test shows no statistical difference in distributions between the amounts sent to non-CFM by CFM and non-CFM- the second panel. Thus, though between-subject decision distributions, i.e. the amounts sent to CFM and to non-CFM differ, there is no difference in within-subject decision distributions, i.e., amounts sent to CFM by CFM and non-CFM vs amounts sent to non-CFM by CFM and non-CFM.

Figure 2: Histogram of the amount sent to CFM members and non-CFM members, by membership



So far I have determined that the differences in amounts sent are related both to the identity of Player 1 (CFM member or not) as well as to the characteristics of Player 2 (CFM member or not), where the latter plays a bigger role. CFM membership thus seems to be important, but we would like to know if the observed differences are really related to CFM membership or could also be due to people's involvement in other types of cooperative behaviors. To find out whether measures of other cooperative action could also play a role, we asked subjects about their participation in different forms of real-world social interaction.

The hypothesis here is that the rate of one's involvement in related social and economic cooperation differs between CFM and non-CFM members. If that is the case, the observed differences in the amounts sent and returned in the trust game may be due to those differences rather than to the CFM membership. To test this hypothesis we examine how the participants' involvement relating to social cooperation within the community varies across CFM and non-CFM members. We consider three measures of social interaction. The first is the number of times per year that a participant is involved in labor sharing (exchange) in relation to farm activities. Involvement of individuals in this labor sharing activity is locally known as "Dabo," and it is one of the three traditional types of social interaction in the study area (Ruben & Heras, 2012). The second type of cooperation is called "Ikub," which is a traditional saving association

in which members make regular contributions to a common fund. And the third type of cooperation is "Idir," which is a group (or social) support system in which people voluntary become members to help each other, specifically in times of deaths and funerals.

Table 5 shows the subjects' involvement in different social interaction activities including Dabo by their CFM membership status. See also Table 2 for the summary statistics of these cooperation measures, namely Dabo, Ikub and Idir, across the villages in our sample.

The variable Dabo takes the values 0, 1 and 2. On average, CFM members do just slightly less than one Dabo activity per year, whereas non-CFM members do on average 2/3 activity. Nevertheless, we cannot reject the null hypothesis of no difference between CFM and non-CFM members (Fisher's exact test, $p = 0.14$).

Table 5: Participants' involvement in cooperative activities by CFM membership status

Actual CFM membership	Dabo per year (Average # times)	Ikub (% participation)	Idir (% participation)
non-CFM member	0.65	0.26	0.62
CFM member	0.93	0.19	0.58
p-values (Fisher's Exact)	0.144	0.289	0.448

The middle column in Table 5 shows that the percentage of subjects' participation in Ikub is rather low in general and the rate does not differ for CFM-members and non-CFM members (Fisher's exact test gives $p = 0.29$). To some extent, the same applies to the last type of cooperation, "Idir." The difference in Idir participation between CFM and non-CFM members is small and not statistically significant (Fisher's exact test $p = 0.45$).

Hence, since as there is no evidence that these cooperative activities differ between CFM and non-CFM members, the conclusion is that the observed differences in amounts sent are mainly due to CFM membership and not due to other types of community involvements. This conclusion is supported if we consider the amounts sent and returned in more detail. Table 6 confirms that the decisions on the amount sent are by and large unaffected by any of the three other social cooperation status, while amounts sent to CFM members are systematically higher than amounts sent to non-CFM members, and this behavior is irrespective of the cooperation type.

Table 6: Amount sent (all) by other cooperation measures

Cooperation type		Amount sent to CFM	Amount sent to non-CFM	No. observations
Idir	Member	19.12	12.63	57
	Non-member	17.95	12.82	39
p-values (Mann-Whitney U test)		0.482	0.616	
Dabo	Cooperator	18.09	12.86	63
	Non-cooperator	19.69	12.42	33
p-values (Mann-Whitney U test)		0.440	0.827	
Ikub	Member	19.05	14.76	21
	Non-Member	18.53	12.13	75
p-values (Mann-Whitney U test)		0.626	0.092	

Being engaged in these other types of social interactions seems to have no effect on the amount sent to CFM members and non-CFM members. Thus, this supports our claim that the identity of the participant (being a CFM member) and the identity of the receiver are the predominant predictors of trust in this model.

Next, let us have a closer look at returner behavior. As can be seen from Table 2, the more Player1 sends, the more is returned by Player 2 on average. Moreover, on average, for every amount sent, at least the initial absolute amount sent was returned on average, and as a result, the mean amount returned (19.89) is higher than the mean amount sent (16.25). A second measure to look at is the share returned, i.e. the amount returned divided by amount received. The mean share returned to both CFM and non-CFM together is 0.37, and shares do not seem to vary much with the amount received. This fraction is similar to the proportions Johnson and Mislin (2011) found in their meta-analysis for most regions (see panel B in Table 3), but slightly higher than average trustworthiness in Africa. Hence, amount returned is a decreasing percentage of amounts tripled.

Furthermore, the mean percentage returned drops from 39.75% when returned to CFM to 34.86% in the case of non-CFM. Wilcoxon matched-pairs signed-ranks tests show that for each of the different amounts sent by Player 2 – that is, 10, 20, 30, 40 and 50 – we can reject the hypothesis that the shares returned to CFM and non-CFM are the same (all p-values are below 0.05). Using the amounts returned instead of the shares gives (of course) similar results. Hence we can conclude that there is a significant statistical difference between the shares (or amounts) returned to CFM members and to non-CFM members.

Finally, I examine whether the membership status of Player 2 (being a CFM member or not) affects trustworthiness. To that end, Table 7 shows the average shares returned by CFM membership status. CFM members return on average less (30.635) than non-CFM members (38.205). The results of Mann-Whitney U tests show that CFM members and non-CFM members return similar amounts to CFM members, with the exception of the case in which 50 is sent (see Appendix 4). This stands in sharp contrast to behavior towards non-CFM members. For all possible amounts, the results of Wilcoxon matched-pairs signed-ranks tests show that there is a statistically significant difference in amounts returned to non-CFM members and to CFM members ($p < 0.02$ in all instances, Table 2). So the difference in amounts returned by CFM and non-CFM members is entirely driven by differences in trustworthiness towards non-CFM members.

Related to this is the finding that CFM members return significantly different amounts to CFM members than to non-CFM members for all possible amounts sent (such that also the average shares differ significantly, see Table 7), whereas, for non-CFM members, there is no statistically significant difference between the amounts returned to both groups.

Table 7: Amount returned to CFM and non-CFM member[4]

	Average share returned to CFM	Average share returned to non-CFM	P-values (Wilcoxon signed-ranks test)

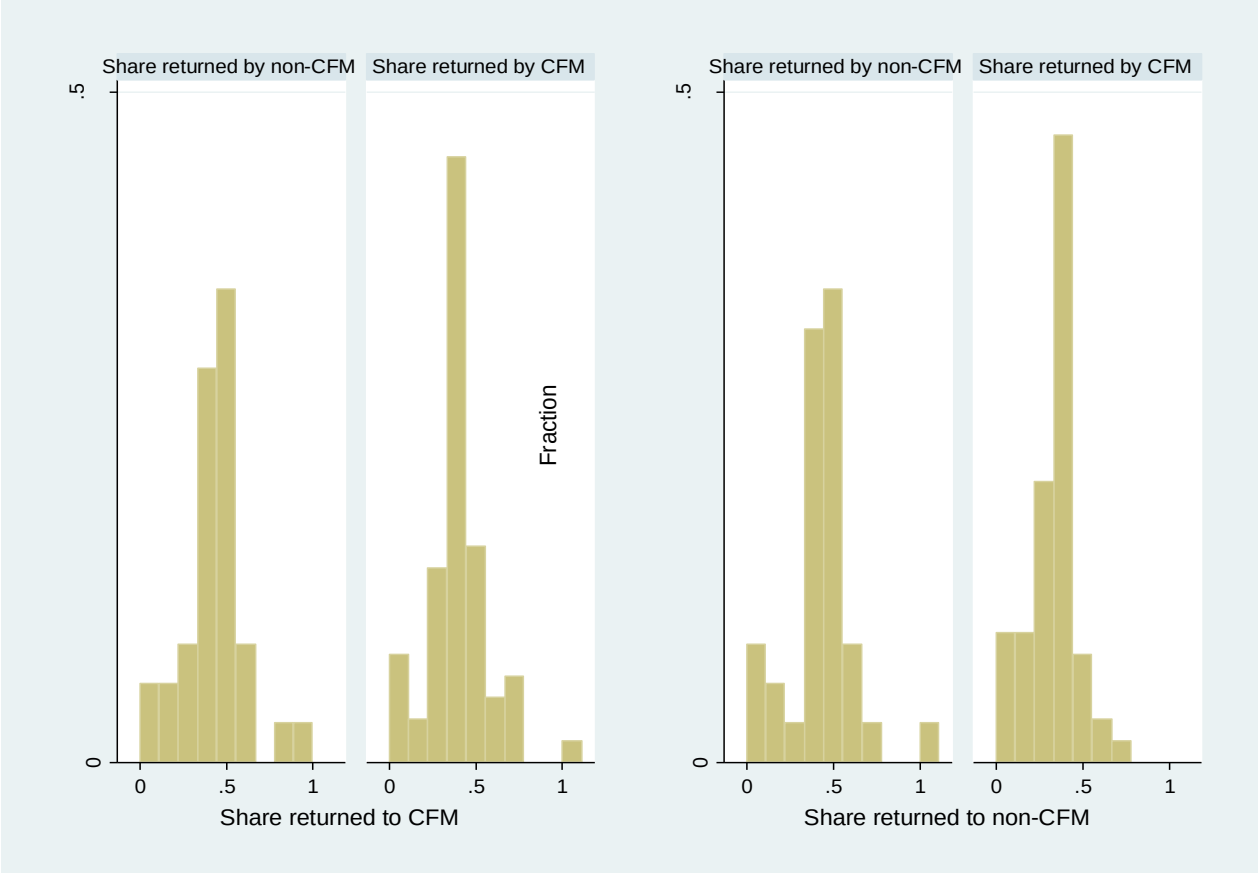
[4] We also have looked at a further classification of the second mover behavior in the following manner; consider amounts returned for all possible amount sent (0, 10, 20, 30, 50, 50) and define the following categories of behavior: Selfish: return always 0, Altruist: return always amount received (i.e. three times amount sent), Equal split: return always half of the amount received, Reciprocal: return at least amount sent, Weakly increasing: return non-decreasing amounts: $R(X) \geq R(X\text{-}10)$ where X is amount sent increasing, Other: any other behavior. (see Appendix 5 for details). The huge majority behave in a reciprocal manner, or can considered to be conditional cooperators: for any amount sent they return at

Average share returned by CFM	0.379 (0.174)	0.311 (0.142)	0.000
Average share returned by non-CFM	0.430 (0.183)	0.420 (0.191)	0.722
P-values (Mann-Whitney U test)	0.147	0.001	
Observations	62	34	

Graphically and more detailed information on the reciprocation decisions taking into account the role of identity can be seen in Figure 3. Figure 3 presents the histograms of the average share returned in the trust game to the CFM and non-CFM members (right panel and left panel, respectively), by non-CFM and CFM members (left figure and right figure, respectively). The distribution of average share returned to non-CFM members (by both CFM and non-CFM members) seems to differ only slightly from the distribution of the amounts returned to CFM. The difference is more observable when the amounts returned to CFM and non-CFM members are examined by the identity of participants (CFM vs. non-CFM). Clearly, CFM members behaved differently towards both parties. Interestingly, the non-CFM also behaved slightly in a different fashion in making the decision of average share returned to CFM and non-CFM members. As a result, the distributions of average share returned to CFM members by CFM and non-CFM members seem to vary. However, that difference is not statistically significant (Kolmogorov-Smirnov test), while the difference in the distributions of average share returned to non-CFM members by both CFM and non-CFM members is statistically significant according to Kolmogorov-Smirnov test.

least that amount. Moreover, the analysis shows that both CFM and non-CFM members reciprocate more when matched with a CFM member than when matched with a non-CFM member.

Figure 3: Histogram of average share returned to CFM members and non-CFM members by identity[5]



3.3 Discussion

The experimental results above indicate that CFM members send and return more to fellow CFM members than to non-CFM members. Non-CFM members send more to CFM members relative to the amounts sent to non-CFM members too. As a result, people who are considered the cooperative type are also more likely to derive higher payoffs, which is in line with the Ostrom's theory of collective action.

A further analysis of regressions (Table 8) seems to confirm that these results are not changed when we control for individual specific characteristics. The results are presented using standard OLS regression, where the standard errors are clustered at the village level.

[5] The reported share returned here is the average share returned over all possible amounts sent by the Player 1 (30, 60, 90, 120, 150). Since the strategy method is utilized, the further classification in Figure 3 is the average amount returned to members and non-members by same membership status.

Table 8: Trust regression

	Amount sent to CFM	Amount sent to non-CFM
	(OLS)	(OLS)
CFM member=1	3.635	-2.658*
	(3.127)	(0.795)
Age (>35)	1.161	1.669
	(0.943)	(1.236)
Education (#Years>6)	5.902	3.445
	(3.754)	(4.088)
House type	2.225	-5.841
	(1.586)	(2.525)
Gender	0.713	-3.110
	(1.079)	(1.188)
Income	-0.000338**	0.0000729
	(0.0000483)	(0.000475)
Land size (hectares)	-0.563	0.870
	(1.695)	(0.870)
Village FE	YES	YES
Constant	11.54***	13.76**
	(1.005)	(2.504)
Observations	96	96
Adjusted R^2	0.192	0.096

*Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01*

Column 1 of Table 8 presents predictors of the amount sent to CFM members. Income seems to explain the amount sent to CFM members. Most importantly, as in the non-parametric tests, the regression (column 1) shows that the amount sent to a CFM member does not depend on membership status. In other words, amounts sent to the cooperators by players of both identities are statistically not different from each other.

Column 2 (Table 8) shows predictors of the amount sent to non-CFM members. CFM membership seems to explain the difference in the amounts sent to non-CFM members namely, CFM members sent significantly lower amounts than non-CFM. Hence, being a non-cooperator is correlated with a lower amount sent by the cooperator, thus reflecting low trust towards the non-cooperators.

However, it is not straightforward to make causal inference of CFM membership and the outcome variables. Causality requires experiment-like settings, i.e. taking CFM as a treatment

variable with the similar characteristics of individuals across CFM membership balanced. In other words, causality requires CFM membership to be an exogenous variable. If the characteristics of individuals across CFM membership are not similar, which may be the case here (see Appendix 2), they should thus be balanced to claim causality. In appendix 2, the endogenous regression model used to test of endogeneity of a binary variable, CFM membership. It does so by allowing for a specific correlation structure between the unobservables that affect the binary variable and the unobservables that affect the potential outcomes. If an unobserved variable affects which group a person gets to be in and affects the outcome as well, we have an endogeneity problem. Table B1 in APPENDIX 2 presents endogenous regressions. Column 1 and 2 indicate the regressions of amount sent to CFM and non-CFM respectively. The bottom panels of the columns show the first stage regression in which probability of CFM is predicted. While the top panel of the regressions shows the role of being a CFM on the amounts sent. In both column 1 and 2 of the table, the likelihood-ratio tests in the last row indicate that we can reject the null hypothesis of no correlation between the original assignment of CFM variable errors and the amounts sent errors. The negative relationships show that unobservables that raise the amounts sent tend to occur with unobservables that lower CFM membership.

Thus, we weighted the observed characteristics across the CFM group to derive results not confounded with other variables, obtaining the ATE (Average Treatment Effect).

Table 9: ATE of CFM membership on trust

	Sent to CFM	Sent to non-CFM
ATE		
1vs 0. CFM	-0.479	-4.823**
	(2.337)	(1.930)
POmean		
0. CFM	18.42***	15.72***
	(1.973)	(1.745)
TME1		
Age (>35)	1.246**	1.246**
	(0.541)	(0.541)
House type	-1.478***	-1.478***
	(0.553)	(0.553)
Land size	0.441**	0.441**
	(0.185)	(0.185)
Constant	-0.529	-0.529

	(0.590)	(0.590)
Observations	96	96
Over identification test (Prob > chi2)	0.6805	0.6805

Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

This was done by using inverse probability weight treatment estimators. Using these estimators, which balance covariates across CFM membership, Table 9 presents the ATE of being a CFM member on the outcome variables (amounts sent).

Table 9 shows the ATE after balancing covariates between the CFM and non-CFM group. Typically, ATE measures the role of a treatment if everyone in the sample is put under that treatment. Column 1 of Table 9 indicates that being a CFM member lowers the amount sent to a fellow CFM member by 0.50 cents from the average of 18.42 ETB sent by a non-CFM member. This difference, clearly, is not statistically significant. In the same way, column 2 of Table 9 shows that being a CFM member lowers the amount sent to a non-CFM member by 4.82ETB from the average of 15.72ETB sent by a non-CFM member. The difference in the amount sent to a non-CFM member by the two types is statistically significant.

As mentioned above, the ATE in this model is calculated by balancing covariates across the CFM group. We tested whether our new model has indeed balanced the covariates between the CFM and non-CFM group. The over-identification test of covariates shows that we cannot reject the null hypothesis that states that covariates are balanced (Prob > Chi2 = 0.6805). Therefore, these results support the findings of the non-parametric test that the CFM members tend to send lower amounts in general and much lower amounts to non-CFM members in particular.

Examination of the subjects' behavior with respect to the amount returned (trustworthiness) using regressions is presented in Table 10. Table 10 also utilizes inverse probability estimators. The ATE after balancing covariates across the CFM group indicates the magnitude of the causal relationship between CFM membership and the share returned.

In column 1 (Table 10), where the output variable is the decision of the share returned to a CFM member, the average share returned by fellow CFM members is 0.043 cents lower than an average of 0.43 cents, the share returned by the non-CFM members. Clearly, this difference is not statistically significant, and the average shares returned by the members and non-

members do not differ from each other, in line with the non-parametric test. On the other hand, as column 2 of the table shows, the share returned to non-CFM members is 0.11 cents lower than 0.42, the share returned by non-CFM members. Again, CFM members returned on average lower shares compared to the shares returned by non-CFM members. In this case, the difference is statistically significant.

Table 10: ATE of CFM membership on trustworthiness

	(1) Returned to CFM	(2) Returned to non-CFM
ATE		
r1vs0. CFM	-0.0428	-0.113***
	(0.0383)	(0.0382)
POmean		
r0. CFM	0.426***	0.424***
	(0.0328)	(0.0335)
Age (>35)	1.246**	1.246**
	(0.541)	(0.541)
House type	-1.478***	-1.478***
	(0.553)	(0.553)
Land size	0.441**	0.441**
	(0.185)	(0.185)
Constant	-0.529	-0.529
	(0.590)	(0.590)
Observations	96	96
Over identification test (Prob > chi2)	0.6805	0.6805

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The reliability of the results (share returned) under this model is examined by conducting the balance test of covariates by CFM membership. The test of over-identification shows that the covariates are balanced. Thus, we cannot reject the null hypothesis that the covariates are balanced (Prob > chi2 = 0.6805). ATE results are in line with the main findings, and confirm that CFM members tend to return lower amounts in general and much lower to non-CFM members. As a result, CFM members earn consistently higher payoffs than non-CFM members. Although the higher payoffs are in line with Ostrom's theory, some other findings on trustee behavior are not. In particular, the alternative hypothesis following from this theory, that cooperative subjects display more pro-social behavior (and thus return more) is not supported.

4. CONCLUSIONS

This study examines trust and trustworthiness between members of a certain group and non-members (CFM and non- CFM members). In settings like this, different theories can be considered to predict the outcomes of matching a certain group members (both with each other and non- members) for economic decision making.

Since the amount sent and returned are designed within the setting of between group member and non-group member decision making, the prediction of social identity theory (see Tajfel, 1974), could be the strategy taken by the subjects. Social identity theory predicts that people favor their fellow in-group member than non-group member if matched in decision making.

Another way to understand in group-out group biases is to look at if these biases have also their beginning originated in indirect evolution theory. Following numerous evidence of conditional cooperators in public good provision and the implication thereof, Ostrom (2014) recommended a revised theory of collective action. This theory uses the indirect evolutionary approach to examine the evolution of conditional cooperators and the role of pro-social behaviors such as trust in cooperation. In an indirect evolutionary approach, players transform the objective payoff of a certain decision into an intrinsic value that is in line with their norms, on which they base their final decision.

In the same theory, there are at least two types of agents – cooperators and selfish agents. And where information about the types of agents is provided, the conditional cooperators will consistently receive a higher payoff. Meanwhile, the selfish agents will receive consistently lower payoff since they are not trusted. Because of the higher payoff, only the cooperators will survive with the complete information process (Ostrom, 2000).

This study tested trust and trustworthiness between CFM and non-CFM member by providing complete information on the types of players in the trust game. I find that trust and trustworthiness are indeed affected by both the characteristics of a player on whom these traits are bestowed and the identity of a bestower. Characteristics of the bestowed, such as being a member of a CFM and thus a cooperator, tend to increase trust towards her/him. However, the CFM members seem to not reciprocate as would conventionally be expected, thus exhibiting low trust towards the senders, specifically the non-CFM members.

In summary, I find that CFM members may trust non-CFM members less (and thus send less), but in fact, non-CFM are more trustworthy (return more). Thus, a higher amount is sent to CFM

members, which shows that they are more trusted. Interestingly, it seems that the non-CFM members tend to signal the CFM members that they can be trusted by sending an even higher amount than what the fellow CFM member sent on average. However, their trust was not reciprocated. The findings in this study seem to be as predicted by Ostrom's collective action theory, that is, as time passes, the conditional cooperators are trusted more and will consistently receive a higher payoffs, while non-cooperators will receive lower payoffs (because they are less trusted). However, we do not have repeated trust game setting to fully claim whether this strategy is stable in the long run. This can be addressed in future research.

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